PATENT APPLICATION

METHOD AND SYSTEM FOR FREEZING TISSUE SAMPLES FOR HISTOLOGICAL AND PATHOLOGICAL EXAMINATION

ABSTRACT OF THE DISCLOSURE

Viable biological material is cryogenically preserved (cryopreservation) by immersing the material in a tank of cooling fluid, and circulating the cooling fluid past the material at a substantially constant predetermined velocity and temperature to freeze the material. The material may either be directly plunged into the cooling fluid without preparation, or chemically prepared prior to freezing. A method according to the present invention freezes the biologic material quickly enough to avoid the formation of ice crystals within cell structures (vitrification) and allows the samples to maintain anatomical structure and remain biochemically active after thaw. The temperature of the cooling fluid is preferably between -20 degrees centigrade and -30 degrees centigrade, which is warm enough to minimize the formation of stress fractures and other artefacts in cell membranes due to thermal changes. Cells frozen using a method according to the present invention have been shown to have a significantly less cellular and intercellular damage than cells frozen by other cryopreservation methods used for pathological and histological techniques. Because the present invention can freeze biological material such that the material is vitrified, biochemical activity within the cell is not lost after freezing and thus various embodiments of the present method may be employed in a system to prepare biological material for the newer techniques of cryopathology and immunohistochemistry in the areas of research and patient care.